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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant	: Thomas A. Froeschle et al.	Art Unit	: 3748
Serial No.	: 10/810,538	Examiner	: Ching Chang
Filed	: March 26, 2004		
Title	: ELECTROMAGNETIC ACTUATOR AND CONTROL		

Mail Stop Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

AMENDMENT A IN RESPONSE TO OFFICE ACTION DATED OCTOBER 28, 2004

Dear Commissioner:

Responsive to the office action mailed October 28, 2004, please amend the above-identified application in accordance with the following pages.

CERTIFICATE OF MAILING OR TRANSMISSION

I hereby certify that this correspondence is being deposited with the United Sates Postal Service with sufficient postage for first class mail in an envelope addressed to the above address, or being facsimile transmitted to the USPTO, on the date indicated below.

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Charles Hieken

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DESCRIPTION

Page 14, line 8, please substitute the following amended paragraphs:

The magnets 68a-68c ~~66a-66c~~ of the armature assembly 64 are configured such that adjacent magnets have opposite radial magnetization. In other words, the uppermost and lowermost magnets, i.e 68a-68c ~~66a-66c~~, have a first radial polarization (e.g., north-south) whereas the magnet located in the middle of the armature assembly, i.e., magnet 68b ~~66~~b, has an opposite radial polarization (e.g., south-north). In this implementation, the actuator 60 uses an overhung design in which the axial height of the magnets, 68a-68c ~~66a-66c~~, is larger than the axial height of the corresponding coils, 64a-64c.

Referring to FIG. 4B, the stator assembly 62 , in addition to including the three coils 64a-64c ~~66a-66c~~, also includes a center pole 70 and a series of interlocking back iron members 72. The center pole 70 is formed of a material having high magnetic permeability (e.g., SMC) and functions as a magnetic return path for the magnetic field generated by the coils.

Page 15, line 4, please substitute the following amended paragraph:

As shown in FIGS. 4E-4F, the armature assembly 64 includes two spacers 82a-82b disposed between the three radially magnetized magnets 68a-68c ~~66a-66c~~. The armature assembly also includes a ball joint assembly 86 that mechanically connects a valve stem 88 to the remainder of the armature assembly. A series of screws disposed in holes 89a-89d secures the ball joint assembly 86 to a coupler 90. One or more clips, e.g., clip 92, mechanically secures the magnets 68a-68c ~~66a-66c~~ and spacers 82a-82b to the coupler 90. The magnets 68a-68c ~~66a-66c~~ and spacers 82a-82b are split 83a, 83b in their axial direction to interrupt the dominant eddy current path.